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UNDESCRIBED SPECIES OF CRANE-FLIES FROM NORTHERN KOREA (DIPTERA, TIPULOIDEA)

By Professor Charles P. Alexander.

(*Massachusetts State College, Amherst, Massachusetts, U.S.A.*)

Manuscript received 29 July, 1944.

(Read 27 April, 1945.)

In the present paper I am considering certain of the new species of Ptychopteridae and Tipulidae that were taken in northern Korea by Mr. Alexander M. Yankovsky between 1937 and 1940. I had earlier described fifty new species from this rich series[1] and there still remains a large amount of unworked material, including several additional novelties. Further extensive collections from many parts of Manchukuo are available and, when studied, will undoubtedly bridge the gaps in distribution now existing between the Amur and Ussuri countries to the north and the Japanese and adjacent Chinese mainland to the south. Nearly one thousand species of these flies are now known from this vast area of eastern and north-eastern Asia. I am particularly indebted to Mr. Yankovsky for his very careful and painstaking efforts to make known the rich Tipulid fauna of northern Korea. My attention was first attracted to the possibilities of the region through a popular article that will well repay reading.[2] The Yankovsky therein described is George Yankovsky, a younger brother of the entomologist who is responsible for the present materials, and for many other groups of insects purchased by various specialists.

In order to present a clearer picture of the country where the Yankovskys have collected, I am quoting a few selections from the numerous letters received between 1937 and 1940, inclusive. An examination of the maps of northern Korea will show the settlements of Seishin, Ranan and Shuotsu along and near the coast, just south of 42° N. Latitude. A few miles inland from the last is Ompo, the residence of the family. To the west rise the Seren Mountains, attaining a maximum altitude of 2540 meters. Still farther to the west and north, close to the border of Manchukuo, lies Mount Chonsani and finally Paiktusan, altitude 2744 meters, the highest peak in Korea (Latitude 42° North; Longitude 128° East).

Seren Mountains, 1938.—"The only road to the Seren Mountains is a private timber road, which was badly damaged by the spring rains. Because of this condition, I was unable to get into these mountains until June 11th. I worked the Seren Mountains steadily from this date until August 14th. On 16 August, 1938, we experienced a terrific flood that completely wrecked the entire road. The oldest Koreans of Ompo do not remember any flood to compare with it. At Ompo, the flood waters reached 31 feet, destroying buildings, forests and vegetation, the finest haunts of the Tipulidae. Nevertheless I have made several trips after the flood, on foot, to altitudes of 1000–2000 feet. On 17 September, 1938, I went all the way to the Seren Pass (4000 feet) and returned on the 21st, and with this I closed my work on the Seren. Before

[1] New or little-known Tipulidae from Eastern Asia (Diptera), XL. 1938, *Philippine Journ. Sci.* **67**: 129–166. The same, XLI. 1940, *ibid.* **71**: 39–76.

[2] Willard Price. Tigers and Butterflies. *Outdoor Life*, July 1936: 24–26, 64.

the flood, I regarded the Seren as very rich for the TIPULIDAE, but these floods washed away virtually all vegetation along the streams. The roads are wrecked by the floods, making it impossible to be reached in early spring of next year. The vicinity of Paiktusan is the only section not involved in this disaster."—Alexander Yankovsky, 11 October, 1938.

Puksu Pyaksan, 1939.—" I travelled about much in June searching for a suitable place to collect, since the terrific floods of 1938 involved not only Ompo and the Seren Mountains but were even worse in the province of Kankyo Nando, where the grassy banks of the rivers were badly washed and eroded. It was only in July that I located a place with suitable grass and moisture. This was at Puksu Pyaksan, altitude 2522 meters, the second highest mountain in Kankyo Nando, being exceeded only by Paiktusan (Pyaktusan).—To-day (11 November, 1939) on the Seren Mountains above Ompo, the snow already lies deep on the mountains."—Yankovsky.

Various altitudes: Ompo, 120–2000 feet; average 600–800 feet. Seren Mountains, 30 miles above the Ompo River; altitudes 2100–6200 feet. Mount Chonsani (Chonsany), near Paiktusan, on the border of Manchukuo, altitude 3000–5100 feet, 12–26 July, 1937.

It should be noted that Alexander Yankovsky in 1938 was 62 years of age and yet was able to stand the unusual physical efforts required by collecting trips such as described.

PTYCHOPTERIDAE.

Ptychoptera yankovskiana sp. n.

. General coloration black, the scutellum more reddish; mesopleura grey pruinose; antennae (male) about one-half the length of body, black, the pedicel reddened apically; femora yellow, the tips conspicuously brownish-black; wings greyish subhyaline, conspicuously patterned with brown, the outer band broken; *Rs* moderately long, approximately one and one-half to twice *r-m*; abdomen black, with reddish-yellow rings on third and fourth segments; male hypopygium large and conspicuous; ninth tergite and dististyle complex in structure.

Male.—Length, about 7·8–8 mm.; wing, 8–8·5 mm.; antenna, about 3·9–4 mm.

Female.—Length, about 9 mm.; wing, 9 mm.

Rostrum black; palpi obscure yellow, the terminal segment black. Antennae (male) relatively short, only about one-half the length of wing, still shorter in female; black, the apex of pedicel and extreme base of first flagellar segment more yellowish; flagellar segments cylindrical, the first segment nearly three times the second. Head polished blue-black; anterior vertex broad, about three times the diameter of scape.

Thorax polished black, the scutellum more reddened. Pleura and pleurotergite black, grey pruinose on mesepisternum and most of pteropleurite; dorsopleural membrane darkened. Halteres with stem yellowish brown, knob somewhat darkened. Legs with hind coxae black, sparsely pruinose, the fore and middle coxae obscure brownish-yellow, darkened only at base; trochanters yellow; femora yellow, the tips rather narrowly but conspicuously brownish-black, the amount subequal on all femora; tibiae yellow, the tips more narrowly dark brown; basitarsi with proximal ends brightened, outer tarsal segments black. Wings greyish subhyaline, the prearcular and costal regions pale yellow; a restricted brown pattern, including a continuous band at cord; a broken band over the forks of veins R_{4+5} and M_{1+2}, the former larger, reaching costa in front; in cases, the costal marking isolated from the larger cloud over R_{4+5}; a small circular brown area at origin of *Rs*; veins dark brown, yellow in the brightened fields. Venation: *Rs* moderately

long, from one and one-half to nearly twice *r-m*; cell R_3 sessile or very short-petiolate; cell M_1 small.

Abdomen black, in male with a conspicuous reddish-yellow ring beyond midlength of third segment and a subequal one occupying the base of the fourth; hypopygium black. In female, the reddish colour is much reduced, only the ring of the third segment being slightly indicated. Male hypopygium large and complex. Ninth tergite large and tumid behind, the caudal margin with a conspicuous circular notch, the lobes thus formed unusually modified and complex; each bifid, the upper arm flattened, earshaped, densely hairy; ventral portion further produced into an irregular lobe that sends a portion laterad and a smaller bilobulate structure caudad and ventrad, these lying opposite one another at midline. Dististyle complex, consisting of an outer bilobed arm from a narrow stem, and an inner triangular darker blade; outer arm with a cylindrical, coarsely setiferous lobule and an inner, more flattened, triangular pale blade provided with short dense setae; inner triangular blade with abundant coarse setae. At base of dististyle with a number of strong powerful spines. Phallosome near apex with numerous strong black spinous setae.

Holotype, ♂, Puksu Pyaksan, Kankyo Nando, altitude 6000 feet, 25 June, 1939 (Yankovsky). Allotopotype, ♀, altitude 5500 feet, 2 July, 1939. Paratopotypes, 2 ♂, with type.

I take unusual pleasure in naming this distinct fly in honour of the collector, Mr. Alexander M. Yankovsky, who has added vastly to our hitherto insufficient knowledge of the TIPULIDAE of Korea. The species is very different from all other regional members of the genus. It is most similar to species such as *Ptychoptera subscutellaris* Alexander, which has the wings less distinctly patterned and with the details of the hypopygium quite distinct. Both species have the abundant spines at the base of the dististyle.

TIPULIDAE.

Prionocera chosenicola sp. n.

Size very large (wing, male, over 17 mm.; antenna about 6 mm.); general coloration grey, the praescutum with three dark brown stripes, the median one vaguely divided for much of its length by a blackened vitta; dorsopleural membrane and pleurotergite extensively yellow; vestiture of mesonotal praescutum short and inconspicuous; antennal flagellum with conspicuous serrations, especially on more proximal segments; wings brownish-grey, the cells beyond cord darker; lateral borders of abdominal tergites broadly yellow; male hypopygium with the tergal lobes narrow; inner dististyle with beak slender, the outer margin of style produced caudad into an oval, lobe-like projection.

Male.—Length, about 15 mm.; wing, 17·3 mm.; antenna, about 6 mm.

Frontal prolongation of head black, heavily pruinose on dorsal half, abruptly yellow on sides and beneath; nasus distinct, tufted with yellow setae; palpi black, the incisures and apex of outer segment a trifle brightened. Antennae unusually long, black, the base of first segment reddened; flagellar segments with very strongly developed pectinations, particularly on segments one to four, on the outer segments becoming shorter. Head strongly darkened, more pruinose on front, anterior vertex behind the antennae, and on the orbits; central portion, including the posterior vertex darker; anterior vertex between the antennal bases narrowly reddened and slightly raised; antennal fossae ringed with yellow.

Pronotum grey pruinose, restrictedly patterned with darker. Mesonotal praescutum with the ground colour grey, clearer on sides, with three dark brown stripes, the broad central one vaguely divided for most of its length by a more blackened capillary vitta; humeral region of praescutum restrictedly yellow; scutum grey, each lobe with two nearly

confluent brown areas; scutellum grey, parascutella abruptly yellow; postnotum with mediotergite grey, its extreme lateral portions yellow; pleurotergite extensively yellow, the anapleurotergite more reddish-brown, the lower part of the katapleurotergite abruptly darkened. Vestiture of thoracic dorsum unusually short and inconspicuous, particularly on praescutal interspaces and the scutum; somewhat longer, but still much shorter than in *serricornis* and allies on posterior sclerites of notum. Pleura grey pruinose, extensively patterned with yellow, including the broad dorsopleural membrane and the metapleura. Halteres with stem yellow, knob infuscated, its apex restrictedly more brightened. Legs with coxae heavily grey pruinose, apex of posterior coxae restrictedly yellow; trochanters yellow; femora obscure brownish-yellow, the tips rather narrowly but conspicuously blackened, the amount subequal on all legs; tibiae brownish-yellow, the tips more gradually and broadly blackened; tarsi black. Wings brownish-grey, the prearcular and costal fields clearer yellow; cells beyond cord, particularly in radial field, more conspicuously infuscated; stigma brown, its proximal end yellow; a brown seam over the cord, especially the anterior cord and *m-cu*; obliterative band before cord relatively narrow and inconspicuous; veins dark brown, more yellowed in the prearcular field. Venation: *Rs* relatively long, nearly twice R_{2+3}; petiole of cell M_1 much shorter than *m*, in one wing of type very short.

Abdomen dark grey, the tergites with a broad and nearly continuous median black stripe, very narrowly broken by yellow posterior margins of the segments; lateral tergal borders broadly yellow; sternites dark grey with yellow posterior margins; hypopygium black, the styli conspicuously yellow. Male hypopygium somewhat as in *subserricornis*; ninth tergite with the principal lobes much narrower, their tips obtusely rounded; median spaces between lobes considerably greater than the basal diameter of lobe; beneath the primary lobes with a slender spinous point, directed laterad (in slide mount); no developed lateral lobes. Inner dististyle with the beak slender, the outer or dorsal margin of style not evenly and gently rounded, as in *subserricornis*, but produced caudad into an oval lobe-like projection; basal lobe of inner edge much less conspicuous than in *subserricornis*.

Holotype, ♂, Puksu Pyaksan, Kankyo Nando, altitude 5500 feet, 17 July, 1939 (Yankovsky).

The present fly is one of the largest species of the genus so far discovered. It rather curiously combines the characters of the two main groups of species found in the Palaearctic region, having the short praescutal vestiture of *turcica* and allies, with the conspicuous flagellar serrations of *serricornis* and allies. The structure of the male hypopygium is quite different from that of the other Palaearctic and Nearctic species. It should be noted that whereas no member of the genus had been found in the Japanese islands, including Sakhalin (Saghalien), no fewer than four species have been discovered in northern Korea, including *Prionocera proxima* Lackschewitz, *P. subserricornis* (Zetterstedt), and the following new species, *P. serenicola*.

Prionocera serenicola sp. n.

Allied to *subserricornis*; wings of male whitish subhyaline, of female more strongly infuscated, with a conspicuous obliterative area before the stigma and anterior cord; male hypopygium with the dorsal tergal lobes unusually narrow, pointed at tips, at their bases only narrowly separated; outer dististyle much narrower on distal portion, particularly at apex; inner dististyle with the dorsal crest low and in alignment with the beak, the two forming a straight line; lower beak separated from the rostrum by an unusually narrow notch that does not exceed this beak in width.

Male.—Length, about 12 mm.; wing, 15·5 mm.; antenna, about 4·8 mm.

Female.—Length, about 15–16 mm.; wing, 14·5–16 mm.

Frontal prolongation of head black, pruinose, a trifle reddened along the sides and more conspicuously yellow at apex of lateral portion; nasus conspicuous. Antennae black, the pedicel and basal half of first flagellar segment more reddened; basal flagellar segments (male) rather conspicuously serrate, particularly the proximal three; in female, the antennae are more uniformly blackened, while the flagellum is very inconspicuously serrulate to nearly simple. Head dark grey, clearer grey on front and along orbits; a conspicuous brown median area on posterior vertex; head broad, eyes small, genae prominent.

Pronotum grey, restrictedly darkened medially. Mesonotum grey, the praescutum with four conspicuous dark brown stripes, the median ground vitta conspicuous; scutal lobes conspicuously patterned with brown; scutellum and mediotergite with a capillary blackened vitta; pleurotergite variegated with yellow on ventral portions. Pleura grey pruinose; dorsopleural membrane yellow. Vestiture of head and thorax elongate, whitish. Halteres with stem yellow, knob dark brown. Legs with coxae grey; trochanters yellow; femora and tibiae yellow, the tips rather narrowly but conspicuously blackened; tarsi black. Wings of male whitish subhyaline, the stigma and a narrow confluent seam over anterior cord dark brown, conspicuous, the proximal end of stigma more yellow; prearcular field more brightened; in female, the ground colour more infuscated, particularly evident as seams along cord and most longitudinal veins; yellow spot at proximal end of stigma larger; a conspicuous obliterative area before stigma and anterior cord; veins dark brown, more yellowish in prearcular field. Venation: R_3 somewhat strongly upcurved, especially in female.

Abdomen dark grey with a darker brown median stripe on tergites, broken into apical spots on sternites; caudal borders of segments narrowly yellow; lateral borders of tergites very broadly yellow. Male hypopygium with dorsal tergal lobes narrow, on distal half obliquely truncated to the subacute points, the distance between these lobes at their bases about one-half their own diameter; on ventral surface with a pair of shorter and more slender hooks, the tips directed mesad; lateral angles of tergite not produced. Outer dististyle relatively narrow, the distal half more slender, the apex narrowly obtuse. Inner dististyle with the entire dorsal margin very low and virtually in a straight line from the beak backward, the beak relatively stout; lower beak unusually prominent, separated from the main rostrum by an unusually narrow notch that is about equal in width to or narrower than the width of the beak itself.

Holotype, ♂, Seren Mountains, altitude 3200 feet, 21 June, 1938 (Yankovsky). Allotopotype, ♀, pinned with type. Paratopotype, ♀.

This distinct fly is readily told from *Prionocera subserricornis* (Zetterstedt) by the less strongly serrate antennae of male, more conspicuous wing pattern, and, especially, the structure of the male hypopygium, particularly of the tergite and both dististyles.

Tipula (Bellardina) tsiosenica sp. n.

Size large (wing, male, over 20 mm.); general coloration grey, the praescutum with four darker grey stripes that are entire or nearly so; antennae with basal flagellar segments bicoloured, black, the basal swellings orange-yellow; femora yellow, their tips blackened; wings yellow, with a pale and relatively uncontrasted darker brown pattern; *Rs* about one-third longer than *m-cu*; male hypopygium with the median region of tergite produced into a complex lobe; both dististyles complex; ninth sternite with an elongate setuliferous cushion along midventral line.

Male.—Length, about 20–23 mm.; wing, 22–25 mm.; antenna, about 6–6·3 mm.

Female.—Length, about 26–27 mm.; wing, 25–26 mm.

Frontal prolongation of head dark brown, grey pruinose, more yellowed apically on sides; nasus conspicuous; palpi with proximal three segments brownish-yellow, the

terminal segment brownish-black. Antennae (male) relatively long; scape light brown at base, darker apically; pedicel yellow; succeeding six or seven segments bicoloured, the basal enlargements orange-yellow, the outer portion blackened, on outer segments the colour uniform brownish-black; basal flagellar segments strongly incised, the outer ones more elongate and less strongly emarginate. Head grey, more yellowish surrounding the antennal bases; anterior vertex virtually without a tubercle, relatively wide, more than three times the greatest diameter of scape.

Pronotum grey, with three more or less distinct, more infuscated areas. Mesonotum grey, the praescutum with four darker grey stripes that are entire or virtually so, the lateral pair with outer margin very vaguely bordered by brown; scutal lobes with two darker leaden grey areas; scutellum and mediotergite with a capillary central brown line; anapleurotergite grey. Pleura with the propleura and posterior pleurites, including the katapleurotergite, yellowish-white, the mesepisternum clearer grey, especially on anepisternum and ventral sternopleurite; dorsopleural membrane extensive, pale yellow. Halteres yellow, the base of knob weakly darkened. Legs with coxae grey; trochanters yellow; femora yellow, the tips conspicuously but rather narrowly blackened, the amount subequal on all legs; tibiae brown; tarsi passing through brownish-black to black; tibial spurs 1–1–2; claws (male) with a single strong tooth at near midlength. Wings broad; ground colour yellow, especially on basal half, beyond cord pale brown, variegated by more whitish-yellow; prearcular and costal fields clearer yellow; stigma oval, yellow; the paler areas occur as a relatively inconspicuous band before cord, extending to basal third of cell M_3; a poststigmal band extending to cell 1*st* M_2; distal third of cell R_5; marginal spots in cells M_1 to M_4 inclusive; basad of cord, the dusky clouds are most evident in outer end of cell *M*, at midlength and near outer end of cell *Cu*, near outer end of cell 1*st A* and as an axillary cloud in cell 2*nd A*, these darkenings very faint and forming a more or less distinct zigzag pattern on the yellow ground; a small but usually distinct brown cloud at origin of *Rs*; veins brown, yellow in the flavous ground areas. Squama with trichia; veins beyond cord with the trichia becoming sparse and scattered on the more posterior veins. Venation: *Rs* short, about one-third longer than *m-cu*, the latter on M_4 some distance beyond origin.

Basal abdominal tergites reddish-brown, their lateral borders broadly more greyish; sixth and succeeding tergites much darker, heavily pruinose, the borders of segments six and seven remaining pale. In female, abdomen usually darker and more pruinose, with a narrower median reddish vitta. Ovipositor with elongate, slender, straight cerci, with smooth margins. Male hypopygium with the tergite entirely separated from sternite; basistyle unusually small, at apex of the slightly produced sternite; ventromesal region of sternite elevated into an elongate-oval lobe or cushion that is covered with delicate setulae. Ninth tergite transverse, the caudal border narrowly deflexed, the median portion produced into a complex lobe, the base expanded and depressed, the central area further produced into a slender capitate rod with a setuliferous cushion beneath it. Both dististyles complex in structure, the outer one directed more caudad, expanded outwardly into flattened pale blades that bear a single slender acute spine on upper margin; inner style directed more dorsad, compressed-flattened, its apex twisted, obtusely rounded. Immediately dorsad of the cushion on the ninth sternite protrude two slender blackened rods or blades that are presumably gonapophyses.

Holotype, ♂, Ompo, altitude 140 feet, 10 June, 1937 (Yankovsky). Allotopotype, ♀, pinned with type. Paratopotypes, 5 ♂♀, altitude 140–600 feet, 4–23 June, 1937; paratype, 1 ♀, Puksu Pyaksan, Kankyo Nando, altitude 6000 feet, 3 July, 1939 (Yankovsky).

From the rather numerous species of the subgenus occurring in Central Asia, the present fly is readily told by the pattern of the antennae and wings, and by the structure of the male hypopygium. These species were listed by

the author (1935, *Philippine Journ. Sci.* **57** : 95) under the subgeneric name *Sinotipula* Alexander, 1935. Recent accessions of material from Tropical America tend to break down the distinctions between this group and *Bellardina* Edwards, 1931, and it seems advisable to place all such species in the latter group.

Tipula (Yamatotipula) ompoensis sp. n.

Belongs to the *iroquois* group; allied to *machidai*; mesonotum grey, the praescutum almost covered by four entire brown stripes; antennae with scape brownish-yellow, the remaining segments black; femora dark brown, the bases narrowly yellow; wings grey with most of the veins seamed with pale brown; abdominal tergites reddish-brown, the caudal and lateral borders more yellowish; male hypopygium with the caudal border of ninth tergite with a conspicuous lobe on either side of median space, this lobe beset with blackened spinous points; inner dististyle with three acute blackened spines, additional to the spinous outer basal lobe; gonapophyses with unusually large and conspicuous elongate-oval blades.

Male.—Length, about 14 mm.; wing, 16·5 mm.; antenna, about 3·7 mm.

Frontal prolongation of head dark brown, grey pruinose, especially above; nasus distinct; palpi dark brown, terminal segment very long, exceeding the others combined. Antennae of moderate length; scape brownish-yellow, remaining segments black; basal enlargements of flagellar segments moderately developed; longest verticils subequal to or a trifle longer than the segments. Head clear grey in front, more brownish-grey on posterior vertex; a capillary dark vitta on anterior vertex; anterior vertex relatively wide, about three times the greatest diameter of scape; vertical tubercle scarcely developed.

Pronotum brownish-grey, vaguely patterned with brown. Mesonotal praescutum with the restricted ground brownish-grey, the disk almost covered by four brown stripes, the posterior interspaces infuscated, almost concolorous with the stripes; scutal lobes almost uniform dark brown, the median area abruptly grey; scutellum grey, variegated with darker on either side of midline, parascutella grey; postnotum clear light grey. Pleura light grey, variegated with darker grey on ventral anepisternum and ventral sternopleurite; dorsopleural membrane yellow. Halteres obscure yellow, the stem clearer. Legs with the coxae light grey, trochanters yellow; femora dark brown, their bases rather narrowly light yellow; tibiae brownish-black; tarsi passing into black; claws (male) conspicuously setiferous, with a single strong tooth. Wings with the ground colour greyish, the prearcular and costal fields a little more yellowed; stigma oval, medium brown; cord and almost all the veins of wing seamed with pale brown, these lacking over most of *M* and on other veins near wing base; veins brown, a little paler in the brightened fields. Macrotrichia of veins relatively conspicuous and abundant, lacking on 1*st* M_2 and bases of medial veins beyond, present on M_{3+4}. Venation: *Rs* long, about twice *m-cu*; veins R_{1+2} and R_3 strongly divergent; petiole of cell M_1 subequal to *m*; M_{3+4} relatively long, about one-half the basal section of M_3; cell 1*st* M_2 pentagonal, relatively wide; *m-cu* long, about two-thirds the distal section of Cu_1; vein 1*st A* arched cephalad, widening its cell, cell *Cu* parallel-sided on its proximal half.

Abdominal tergites reddish-brown, without distinct stripes; caudal and lateral borders of tergites narrowly yellow, broader on outer segments; sternites clear yellow; outer segments more uniformly dark brown. Male hypopygium with the ninth tergite deformed, in its normal condition apparently dark brown with the outer lobes and caudal margin yellow; caudal border apparently with two widely separated rounded tubercles, each set with several short black spines; dorsal surface of tergite with abundant black setae. Outer dististyle flattened, narrowed outwardly, the length about two and one-half times the greatest width. Inner dististyle complex; outer basal lobe a strong blackened spine; main body

of style with three acute blackened spinous points in addition to the beak, the two shorter of these spines arising from the outer angles of a flattened dorsal plate; sensory area conspicuous. Gonapophyses with very short stems and unusually large and flattened, elongate-oval blades.

Holotype, ♂, Ompo, altitude 200 feet, 1 June, 1937 (Yankovsky).

Tipula (*Yamatotipula*) *ompoensis* is allied to various Japanese species such as *T.* (*Y.*) *kamikochiensis* Alexander, *T.* (*Y.*) *machidai* Alexander and *T.* (*Y.*) *sempiterna* Alexander, differing from all in the structure of the male hypopygium. As I have indicated in other papers, rather numerous additional species of this group occur in the eastern United States, particularly in the southern Appalachians.

Tipula (Yamatotipula) ompoensis labiosa subsp. n.

Male.—Length, about 14–16 mm.; wing, 17–19 mm.; antenna, about 3·5–3·6 mm.

Female.—Length, about 18 mm.; wing, 21 mm.

Close to typical *ompoensis*, differing as follows: Intermediate praescutal stripes separated by a narrow but conspicuous blackened median vitta; stripes more conspicuously margined with darker. Wings broader, more strongly darkened; longitudinal veins beyond cord not or scarcely seamed with darker. Male hypopygium with the ninth tergite extensive, narrowed outwardly, the caudal margin with two broad lobes that are separated from one another by a deep U-shaped notch that is only about one-half as wide as either lobe; apex of each lobe with more than thirty blackened spinous points. The entire region of the ninth sternite is unusually swollen and tumid, filled with pale membrane that protrudes ventrad (in alcoholic material) as a large and bulbous extension.

Holotype, ♂, Puksu Pyaksan, Kankyo Nando, altitude 6000 feet, 8 June, 1939 (Yankovsky). Allotype, ♀, Ompo, altitude 200 feet, 4 June, 1937. Paratypes, 9 ♂, with the allotype, altitude 130–750 feet, 4–20 June, 1937; 7 June, 1938 (Yankovsky).

The shape of the ninth tergite is entirely different from that of the typical form and I cannot reconcile the two flies as being consubspecific.

Tipula (Yamatotipula) chonsaniana sp. n.

Belongs to the *moesta* group; general coloration grey, the praescutum with four entire brown stripes; antennae with scape and pedicel yellow, flagellum black, with only the base of the first segment pale; femora obscure yellow, the tips narrowly blackened; wings brownish-yellow, stigma brown, relatively conspicuous; basal abdominal tergites obscure orange medially, more infuscated on either side, the outer segments more uniformly dark brown; male hypopygium with median region of tergite produced into a rounded lobe that is subtended on either side by narrower points, the central lobe set with abundant blackened spinous points; inner dististyle with the rostrum an unusually long slender rod.

Male.—Length, about 12·5–13 mm.; wing, 12·5–13·5 mm.; antenna, about 4·2–4·5 mm.

Female.—Length, about 15 mm.; wing, 14 mm.

Frontal prolongation of head dark grey above, infuscated on ventral surface, the sides with a narrow yellow line; nasus distinct; palpi brown, the outer segment passing into black. Antennae (male) of moderate length; scape and pedicel yellow; first flagellar segment yellow on proximal two-thirds, the tip abruptly blackened; remaining segments black, moderately incised, the basal swellings conspicuous; longest verticils a little shorter than the segments; terminal segment small, only about one-fourth as long as the penultimate. Head clear light grey; vertical tubercle moderately developed, darker grey, with

a central brown line that extends back to midlength of posterior vertex; anterior vertex broad, fully four times the diameter of scape; eyes relatively small.

Pronotal scutum light grey, dark brown medially; scutellum and lateral pretergites yellow. Mesonotal praescutum grey, with four entire brown stripes, the intermediate pair more or less confluent at both ends; scutum grey, each lobe with two brown areas, the more cephalic one reduced to a narrow line; scutellum grey, the extreme lateral portions restrictedly yellow, parascutella grey, narrowly bordered by yellow; mediotergite light grey; pleurotergite chiefly grey, the dorsal half of katapleurotergite yellow, this colour further involving the adjacent portions of the mesepimeron and metapleura. Pleura clear grey; dorsopleural membrane clear light yellow, conspicuous. Halteres with stem obscure brownish-yellow, knob infuscated. Legs with coxae grey; trochanters yellow; femora obscure yellow, the tips rather narrowly but conspicuously blackened, the amount subequal on all legs; tibiae yellowish-brown, the tips passing into brownish-black; tarsi black; claws (male) with a conspicuous tooth. Wings with a brownish-yellow tinge, the prearcular and costal fields a little clearer yellow; stigma brown, relatively conspicuous; obliterative areas very restricted, including the outer end of cell *R*, 1*st* M_2 and extreme base of M_3; veins brown, more yellow in the brightened fields. Macrotrichia of veins abundant. Venation: R_{1+2} entire or with the extreme tip pale; *Rs* relatively long, a little less than twice *m-cu*; petiole of cell M_1 less than twice *m*; M_{3+4} a trifle exceeding *r-m*.

Abdomen with first tergite obscure orange, patterned on either side with brown; succeeding tergites with median region obscure orange, on either side broadly more infuscated, the orange becoming obsolete on about the fifth tergite; caudal borders narrowly, the lateral margins more broadly pale; basal sternites obscure orange medially, darker laterally, the caudal margins narrowly yellow; outer segments more uniformly infuscated. Male hypopygium with the median region of tergite a rounded lobe that is set with numerous black spinous points, subtended on either side by a glabrous, more pointed lobe. Outer dististyle broadly flattened, narrowed outwardly, the tip obtuse. Inner dististyle appearing as a broadly flattened blade that is produced into a long, slender, spiniform beak; on side of blade near base with a conspicuous elongate rod, its tip obtusely rounded. Gonapophyses with only the bases preserved, the outer ends narrowed into pale membrane, not expanded into blades as common in many species of the subgenus.

Holotype, ♂, Chonsani, altitude 3700 feet, 17 July, 1937 (Yankovsky). Allotopotype, ♀, altitude 3200 feet, 12 July, 1937. Paratopotypes, 2 ♂, altitude 3200–3500 feet, 12–23 July, 1937.

This interesting fly is closest to *Tipula* (*Yamatotipula*) *freyana* Lackschewitz and *T.* (*Y.*) *moesta* Riedel (equals *haplocera* Bergroth; *simplicicornis* Lundstrom, *nec* Zetterstedt) of Arctic Eurasia, but is entirely distinct in the details of the male hypopygium, especially the inner dististyle. It is of interest to note that *reyana* likewise occurs in the mountains of northern Korea.

Tipula (Oreomyza) persignata sp. n.

Belongs to the *marmorata* (*fragilis*) group; allied to *signata*; size large (wing, male, over 15 mm.); femora yellow, the tips blackened; wings whitish subhyaline, extensively clouded with grey and more restrictedly patterned with brown; abdomen yellow, the outer segments blackened; male hypopygium with the tergal horns pale, provided with a few blackened spinous points; outer dististyle without basal spine; inner dististyle with outer basal lobe short and compact, corrugated on dorsal surface; eighth sternite with median lobule small.

Male.—Length, about 14 mm.; wing, 15·8 mm.; antenna, about 4·7 mm.

Frontal prolongation of head relatively long, dark brown; nasus slender; palpi dark brown, the terminal segment slightly darker. Antennae with scape and pedicel light yellow;

bases of flagellar segments black, the pedicels a very little paler; flagellar segments moderately incised; verticils shorter than the segments. Head light grey.

Pronotum grey. Mesonotal praescutum grey, with four entire brown stripes, the intermediate pair widened in front but still separated, narrowed behind, the median pale ground line correspondingly wide; scutum dark grey, each lobe with two brown spots; scutellum dark brownish-grey; postnotum lighter grey, with vague indications of a darker median line; pleurotergite grey. Pleura light grey, variegated with darker grey, especially on ventral anepisternum, ventral sternopleurite and meral region; dorsopleural membrane yellow. Halteres with stem yellow, knob infuscated, the apex slightly brightened. Legs with coxae grey; trochanters yellow; femora yellow, the tips rather broadly and very conspicuously blackened, the amount subequal on all legs; tibiae and basal two tarsal segments yellow, their tips narrowly more infuscated; outer tarsal segments blackened; claws (male) with a conspicuous tooth. Wings with the ground colour whitish subhyaline, patterned with grey clouds and more restricted dark brown areas; prearcular field more yellowed; cell *Sc* and the stigma uniformly dark brown; narrow dark brown seams over anterior cord, *m-cu* and vein *Cu*, on the last more or less interrupted at near two-thirds the length of cell *M*; chief pale ground areas include a major mark from vein *Cu* to the margin in outer end of cell *2nd A*; a second area in outer two-thirds of cell *M*, recurring in cell *Cu* but interrupted by the darkening along vein *Cu*; prestigmal fascia less conspicuous, extending from *C* across cell *1st* M_2 into the base of cell M_3; post-stigmal brightening virtually restricted to the base of cell R_2; veins dark brown; obliterative areas conspicuous. Venation: *Rs* one-third longer than *m-cu*; petiole of cell M_1 shorter than *m*.

Abdomen with basal tergites yellow, the outer segments becoming more infuscated and slightly pruinose, not forming distinct stripes; outer segments, including hypopygium, more uniformly darkened; basal sternites yellow, more or less patterned with brown, this appearing abnormal. Male hypopygium much as in *signata*, particularly in the eighth sternite. Ninth tergite with the decurved lateral portions pale, relatively short, provided with about a dozen blackened spinous pegs. Outer dististyle slender, without a blackened basal spine. Inner dististyle with the outer basal lobe short and compact, blackened, transversely corrugated on its outer or dorsal portion. Eighth sternite strongly protruding, as in *signata*, the conspicuous lobes provided with powerful, mesally directed black spines; median lobule small. In *signata*, the tergal lobes are heavily blackened, directed laterad; outer dististyle with a strong blackened spine near base; inner dististyle with the outer basal lobe produced into a long curved flattened blade; median lobule of eighth sternite very large and conspicuous.

Holotype, ♂, Ompo, altitude 700 feet, 30 October, 1937 (Yankovsky).

This striking species, with the further subspecies described below, is most nearly allied to the European *Tipula* (*Oreomyza*) *signata* Staeger (*anonyma* Bergroth) and *T.* (*O.*) *staegeri* Nielsen, differing in the structure of the male hypopygium, as indicated above. The superficial resemblance to *T.* (*O.*) *coreana* Alexander is most striking but the hypopygia of the two species are entirely different.

Tipula (Oreomyza) persignata tofina subsp. n.

Similar in its general appearance to the typical form, differing in certain characters of the hypopygium. Ninth tergite with the caudal notch wide, the lateral borders and narrow apical spines heavily blackened, the latter decurved. Inner dististyle with the outer basal lobe more produced at apex into a flattened upcurved blade, its apex obtusely rounded.

Holotype, ♂, Puksu Pyaksan, Kankyo Nando, altitude 6200 feet, 29 July, 1939 (Yankovsky).

Tipula (Oreomyza) lanio sp. n.

General coloration grey, the praescutum with four darker brownish-grey stripes; antennae (male) with scape and pedicel yellow, flagellum black, the segments strongly incised; legs black or brownish-black, the femoral bases yellow; claws (male) simple; wings strongly infuscated, very restrictedly patterned with slightly darker and more yellow areas; venation very variable; R_{1+2} entire to partly atrophied, petiole of cell M_1 elongate to very short; abdominal tergites reddish-yellow, trivittate with brownish-black; male hypopygium with the ninth tergite notched medially, with a broad or weakly double tooth at base of notch; beak of inner dististyle flattened and expanded at apex into a weak spatula.

Male.—Length, about 11–12·5 mm.; wing, 12·5–14·5 mm.; antenna, about 5·6–6 mm.

Frontal prolongation of head relatively short, grey; nasus stout, provided with yellow setae; palpi brownish-black. Antennae (male) relatively long; scape and pedicel light yellow, flagellum black; flagellar segments strongly incised, with conspicuous basal enlargements; verticils shorter than the segments; terminal segment reduced to a tiny cone. Head grey; a more or less distinct capillary brown median vitta; vertical tubercle very low and broad.

Pronotum grey, the scutellum obscure yellow. Mesonotal praescutum light grey, with four entire darker brownish-grey stripes; median ground vitta very narrow at its anterior end, more widened behind; scutum dull grey, each lobe with two darker brownish-grey areas; scutellum and postnotum light grey; posterior portion of katapleurotergite a trifle paler. Pleura light grey; dorsopleural membrane pale yellow. Halteres with stem yellow, knob infuscated, its apex a trifle brighter. Legs with coxae grey; trochanters yellow; femora black, the basal fourth or fifth obscure yellow; tibiae and tarsi brownish-black; claws small, simple. Wings strongly infuscated, very restrictedly patterned with slightly darker and more yellowish areas; prearcular and costal fields clear yellow; stigma oval, brown; small and restricted brown clouds over origin of *Rs* and anterior cord; obliterative areas including two small separate areas, one before stigma, the second across the base of cell 1*st* M_2, barely involving the adjoining portions of cells *R* and M_3; much less distinct obscure yellow marks beyond stigma, near outer end of cell *M*, and near bases of cubital and anal cells; veins brown, yellow in the patterned areas. Squama naked; veins of outer half of wing with very abundant setae. Venation: Unusually variable; usually with distal one-third to two-thirds of R_{1+2} atrophied, in rare cases with the vein entire; *Rs* somewhat variable in length, usually about twice *m-cu* or a little longer; petiole of cell M_1 variable in length, usually shorter than *m*, in some cases very short while in others it is twice as long as *m*; *m* tending to be weak or, in abnormal specimens, atrophied so that cell M_2 is open.

Abdomen obscure reddish-yellow, the tergites trivittate with brownish-black, including a narrow median vitta that is broadly interrupted at the posterior borders of segments, becoming more continuous on outer portion; sublateral stripes paler and less distinct; basal sternites more uniform reddish-yellow, darker laterally, this becoming more evident on the outer segments; subterminal segments more uniformly darkened, sparsely pruinose; most of hypopygium reddish-yellow. Male hypopygium with the tergite broadly emarginate, the base of the notch with a very broad to weakly double central tooth; lateral lobes subtruncate to very obtuse. Outer dististyle relatively long and narrow, its length exceeding four times the greatest width. Inner dististyle without a developed outer basal lobe; beak flattened and expanded at apex into a weak spatula; lower beak short and obtuse, blackened. Ninth sternite with an elongate-cylindrical darkened lobe. Eighth sternite unarmed.

Holotype, ♂, Seren Mountains, altitude 3000 feet, 25 June, 1938 (Yankovsky). Paratopotypes, 12 ♂, altitude 2500–4200 feet, 2 June–6 July, 1938.

Tipula (*Oreomyza*) *lanio* is quite distinct from other regional species of the subgenus, especially in the strongly incised flagellar segments, blackened legs, very diffuse wing pattern, and structure of the male hypopygium, particularly the tergite. It is somewhat similar to *T.* (*O.*) *famula* Alexander, yet quite distinct in all regards.

Tipula (Oreomyza) phryne sp. n.

Allied to *mutila*; general coloration grey, the praescutum with four entire darker grey stripes; antennae with basal three segments yellow, the remainder almost uniformly blackened; wings light cinnamon brown, conspicuously patterned with whitish, the latter including a broad complete band beyond cord and scattered spots on basal half of wing; R_{1+2} entirely or partly atrophied; basal abdominal segments of male obscure yellow, darker medially, outer segments more uniformly darkened; male hypopygium with the tergite broadly notched medially, with a long slender spine at base of notch; inner dististyle with conspicuous spinous points, including the lower beak and outer basal lobe.

Male.—Length, about 12–13 mm.; wing, 14–14·5 mm.; antenna, about 3 mm.

Female.—Length, about 14–15 mm.; wing, 15 mm.

Frontal prolongation of head relatively long, nearly equal to the remainder of head, brown, heavily grey pruinose above, becoming obscure yellow on sides; nasus conspicuous, tipped with yellow; palpi brownish-black. Antennae with basal three segments yellow; succeeding flagellar segments very weakly bicoloured, the basal enlargement being a trifle darker than the remainder of segment. the outer ones more uniformly blackened; flagellar segments rather strongly incised; longest verticils a little shorter than the segments. In female, the much shorter antennae are uniformly yellow for about half their length, the outer segments darker. Head grey; a very delicate dark capillary vitta; vertical tubercle low and obtuse, entire.

Pronotum grey; scutellum pale yellow, more obscure on sides. Mesonotum grey, the praescutum with four entire darker grey stripes that are scarcely differentiated from the ground; scutal lobes patterned with darker grey; mediotergite with a delicate median brown vitta. Pleura grey, the dorsopleural membrane pale yellow. Halteres with stem yellow, knob dark brown. Legs with coxae grey; trochanters yellow; femora obscure yellow, clearer basally, the tips scarcely or only very weakly darkened; tibiae obscure yellow, the tips very narrowly infuscated; tarsi passing into brownish-black; claws (male) toothed. Wings with a rich light cinnamon brown ground, conspicuously patterned with white; prearcular and costal fields, particularly cell *Sc*, clear yellow; stigma darker brown but relatively inconspicuous, continued basad in costal cell to opposite the end of vein *Sc*; the white colour occurs as a broad complete crossband beyond cord, extending from costa to posterior border of wing in cell M_3; basad of cord with conspicuous white spots, in most specimens well developed, arranged as follows: Across *Rs* before midlength; in cell *R* immediately basad of origin of *Rs*; distal third of cell *M*, crossing vein *Cu* into cell *Cu*; nearer base of cell *Cu*; cell 1*st A* with three smaller white spots; wing apex and cell 2*nd A* uniformly of the ground colour; veins brownish-yellow, clearer yellow in the brightened fields. Venation: R_{1+2} atrophied, in cases with a short basal spur; *Rs* relatively long, a little less than three times *m-cu*; cell M_1 short-petiolate to sessile; *m-cu* a short distance beyond base of M_4, forming a short vertical basal section of the latter.

Abdomen of the male with the first tergite obscure yellow, variegated with pale brown; subbasal tergites obscure yellow, with a broad median brown stripe that is very narrowly interrupted at the posterior borders of the segments; no lateral darkenings on the more basal segments; on about the fourth tergite the amount of dark colour becomes much more extensive, more or less pruinose; basal sternites uniformly clear yellow, the outer segments becoming strongly darkened; hypopygium more castaneous. In female, abdomen more

uniformly darkened. Ovipositor with long slender cerci. Male hypopygium with the caudal margin of tergite having a broad U-shaped notch, with a long, slender spine from the base; lateral lobes broad, truncated, the mesal angles slightly produced; margins of lobes towards the midline with microscopic serrulations. Outer dististyle a flattened spatula. Inner dististyle with the lower beak unusually large, developed into a blackened blade that terminates in an acute point directed outwardly, outer basal lobe only slightly developed, hairy, terminating in a long slender spinous point; outer margin of style with a further spinous production of the dorsal crest. Gonapophyses appearing as stout lobes that are strongly bent and narrowed into long spines. Eighth sternite with outer margin evenly and convexly rounded, unarmed.

Holotype, ♂, Ompo, altitude 190 feet, 2 June, 1937 (Yankovsky). Allotopotype, ♀, with the type. Paratopotypes, 6 ♂♀, altitude 100–190 feet, 2–23 June, 1937; 23 May, 1938 (Yankovsky).

Although it is generally similar in appearance to species centring about *Tipula* (*Oreomyza*) *mutila*, the present fly is very different in the wing pattern and in the structure of the male hypopygium. The ninth tergite is somewhat as in *T.* (*O.*) *mesacantha* Alexander, which is otherwise entirely distinct. The rather numerous species of the *mutila* group in eastern Asia have been listed by me in another paper (1935, *Philippine Journ. Sci.* **57** : 122).

Tipula (**Lunatipula**) **fulminis** sp. n.

Belongs to the *fascipennis* (*bicornis*) group; size large (wing, male, 18 mm.); mesonotum extensively grey, the praescutum patterned with brown; wings with a strong dusky suffusion on distal half, the basal portion much paler; obliterative band along cord very extensive and conspicuous, virtually crossing the wing; male hypopygium very large, the tergite chiefly fused with the sternite; median region of tergite produced into two slender decurved horns that lie relatively close together on either side of midline; dististyle a large yellow flattened scoop, its mesal face with abundant long yellow setae; eighth sternite only moderately sheathing; ovipositor unusually large and obtuse, the hypovalvae especially enlarged.

Male.—Length, about 16 mm.; wing, 18 mm.; antenna, about 5·5 mm.

Female.—Length, about 16 mm.; wing, 17·5 mm.

Frontal prolongation of head buffy yellow; nasus very short; palpi brown, outer segment brownish-black. Antennae moderately long, shorter in female; basal three segments (male) obscure yellow, the succeeding segments weakly bicoloured, pale brown, the basal swellings darker brown; outer segments uniformly blackened; flagellar segments weakly incised, gently sigmoid. Head buffy yellow, restrictedly grey on occiput; no vertical tubercle; bristles of head, particularly the outer vertical and orbital ones, strong.

Pronotum pale greyish-brown. Mesonotal praescutum with the ground colour of disk obscure greyish-yellow, the sides grey pruinose; a conspicuous entire, dark brown, median stripe, ending squarely some distance before suture; lateral stripes more greyish-brown; central region of scutum and posterior portions of lobes obscure yellow, the centres of lobes conspicuously dark grey; scutellum and postnotum brownish testaceous, weakly pruinose, setae long and conspicuous, yellow; mediotergite and anapleurotergite somewhat more yellowed. Pleura obscure yellow, variegated with grey, darkest and most conspicuous on the ventral sternopleurite. Halteres with base of stem and apex of knob yellow, the remainder infuscated. Legs with the coxae yellow, sparsely pruinose; trochanters yellow; femora obscure yellow, the tips rather narrowly blackened, the amount subequal on all legs; tibiae brownish-yellow, the tips narrowly blackened; tarsi black, proximal portions of basitarsi paler; claws (male) with conspicuous tooth. Wings with a strong dusky suffusion on distal half, the proximal portion more brownish-yellow, this pattern more

accentuated in the female; in both sexes the obliterative band before stigma and along cord unusually extensive and very conspicuous against the ground, suggesting the specific name; this band begins at costa in the brightened proximal end of the stigma, not quite reaching the posterior border of wing in cells M_3 and M_4 along vein M_4, barely interrupted by a yellowish or brownish seam along *Rs*; posterior portion of stigma restrictedly more infuscated; veins brown, more yellowed in the costal portion, the veins in the obliterative band conspicuously whitened. Venation: *Rs* long, about two and one-half times *m-cu*; basal section of R_{4+5} short to very short, *r-m* correspondingly long, in the allotype joining *Rs* close to the fork; cell 1*st* M_2 relatively small, pentagonal.

Abdomen yellowish-brown, on subterminal segments with a more or less distinct median brown stripe; ninth segment uniformly dark brown. Male hypopygium very large and conspicuous, the tergite and sternite chiefly fused, separated only by an outer, nearly vertical, membranous line. Tergite tumid, produced apically into two slender castaneous horns that are strongly decurved, narrowed apically into acute points; viewed from above, the tergal horns lie relatively close together, their greatest separation about equal to the maximum breadth across the base of a single horn. Dististyle appearing as a broadly flattened, yellow, scoop-like blade, the beak small and abruptly narrowed, the mesal faces of the lobes conspicuously and densely clothed with long yellow setae. Eighth sternite only moderately large and sheathing, the lateral angles bearing slender weak spines at the tips of subequal stout lobes; median area of caudal portion with dense hair brushes, the intermediate pair directed more outwardly than the lateral groups. Ovipositor as in the group, especially in species such as *parshleyi*; unusually short and obtuse, particularly the hypovalvae, which are large and tumid, their basal upper portion produced dorsad into a triangular flattened lobe; cerci much smaller, appearing as nearly circular flattened plates.

Holotype, ♂, Puksu Pyaksan, Kankyo Nando, altitude 5000 feet, 2 August, 1939 (Yankovsky). Allotopotype, ♀, altitude 6000 feet, 11 August, 1939.

This striking crane-fly requires little comparison with the five other described members of the group so far made known in eastern Asia. The most similar species is *Tipula* (*Lunatipula*) *validicornis* Alexander, but the resemblance is not particularly close. I have described the male hypopygium from the dry type rather than attempting to make a slide mount of this unusually large structure.

Limonia (Dicranomyia) perserotina sp. n.

Belongs to the *tristis* group; general coloration brownish-black, the praescutum chiefly darkened; halteres with blackened knobs; wings greyish subhyaline, vaguely patterned with darker, including the stigma and scarcely evident seams over cord and outer end of cell 1*st* M_2; *Sc* short, Sc_1 ending just beyond origin of *Rs*; M_{3+4} longer than M_4; male hypopygium with the caudal margin of the ninth tergite convexly rounded; dorsal dististyle a powerful, strongly curved, blackened rod, its distal half narrowed into a spine; ventral dististyle oval, the rostral prolongation with two widely separated black spines; gonapophyses with mesal-apical lobe blackened, nearly straight, the edge irregularly toothed or erose.

Male.—Length, about 5 mm.; wing, 5·8 mm.

Rostrum and palpi black. Antennae broken. Head black, very sparsely pruinose; eyes large, with coarse ommatidia; anterior vertex relatively narrow, about equal to three rows of ommatidia.

Pronotum dark brown. Mesonotal praescutum brownish-black, the humeral and lateral portions somewhat more reddened; scutal lobes brownish-black, the median area behind and the central portion of scutellum obscure yellow; sides of scutellum blackened; para-

scutella chiefly pale; postnotum light brown, more blackened laterally; pleurotergite chiefly obscure yellow. Pleura brownish-black, the metepimeron more yellowish. Halteres pale, knobs blackened. Legs with fore coxae brownish-black, middle and hind coxae paler; trochanters obscure yellow; remainder of legs broken. Wings greyish subhyaline, very vaguely patterned, including the pale stigma and poorly defined seams along cord and outer end of cell 1*st* M_2; extreme wing base more whitened; veins brown. Venation: *Sc* short, Sc_1 ending just beyond origin of *Rs*, Sc_2 a short distance from its tip, opposite the origin of *Rs*, Sc_1 alone being subequal to *r-m* and not more than one-fourth the length of the stigma; *Rs* fully twice the basal section of R_{4+5}; M_{3+4} longer than M_4; *m-cu* just before the fork of *M*; vein 2*nd A* beyond its origin nearly straight.

Abdomen dark brown. Male hypopygium with the tergite transverse, its caudal margin convexly rounded; before the edge with longitudinal rows of setae on either side of midline. Basistyle moderately large, its total area a trifle less than that of the ventral dististyle. Dorsal dististyle a powerful, strongly curved, black rod, the distal half very gradually narrowed into a long tenuous spinous point. Ventral dististyle oval, the rostral prolongation relatively small and weak, especially beyond the outer spine; spines widely separated, the more basal one a little longer and more slender, placed at the base of prolongation, the outer one separated from the former by about its own length, shorter but stouter, from a slightly more evident basal tubercle. Gonapophyses with mesal-apical lobe conspicuously blackened, nearly straight, the edge irregularly toothed or erose.

Holotype, ♂, Ompo, altitude 1200 feet, 3 November, 1937 (Yankovsky).

The present fly is most similar to species such as *Limonia* (*Dicranomyia*) *variispina* Alexander, differing conspicuously in the structure of the male hypopygium.

Orimarga Osten Sacken **Limnorimarga** subgen. n.

Rostrum short, unproduced. Antennae 16-segmented; flagellar segments oval; terminal segment subequal to the penultimate. Anterior vertex (male) reduced to a narrow strip, eyes correspondingly large. Praescutum with tuberculate pits lacking; pseudosutural foveae inconspicuous; thoracic shape as in *Limonia*. Halteres elongate. Legs with the claws long, simple; empodia present, elongate. Wings with the venation of *Limonia*; *Sc* long, Sc_1 ending opposite fork of *Rs*, Sc_2 some distance from its tip, Sc_1 alone subequal to the basal section of R_{4+5}; *Rs* long, nearly straight; R_2 about one-half R_{1+2}; cell 1*st* M_2 closed, much shorter than any of the veins beyond it; *m-cu* shortly beyond the fork of *M*; cell 2*nd A* widest opposite the anal angle of wing. Male hypopygium much as in *Orimarga* s.s.; dististyles long and slender, more or less fused at their bases, the outer style strongly curved at tip.

Type of subgenus.—*Orimarga* (*Limnorimarga*) *limonioides* sp. n. (Eastern Palaearctic Region: Northern Korea).

The fly here discussed is one of the most puzzling I have ever seen and is certain to be the subject of controversy in future. The combination of characters of *Limonia*, as shown by the venation, and of *Orimarga*, as shown by the 16-segmented antennae, pretarsus and claws, and the structure of the male hypopygium, is most amazing. Hitherto we had known of no intermediates between the subtribes Limoniaria and Orimargaria. In brief, the venation is exactly as is found in various species of *Limonia* Meigen, particularly in the subgenus *Libnotes* Westwood, while the antennae, legs and male hypopygium are equally as in *Orimarga*. Because of the preponderance of characters on the latter side, I am placing the fly in *Orimarga* but with the realisation that when better known the group will very probably be raised to full generic status.

Orimarga (Limnorimarga) limonioides sp. n.

General appearance much as in *Limonia*; general coloration black; rostrum, palpi and antennae black; halteres elongate, knob brownish-black; wings with a strong, uniformly blackish tinge, the stigma scarcely differentiated; vein R_2 present; cell 1*st* M_2 closed; *m-cu* beyond the fork of M; male hypopygium with both dististyles elongate, as in *Orimarga*.

Male.—Length, about 7 mm.; wing, 7·3 mm.

Rostrum and palpi black. Antennae black throughout; flagellar segments oval; longest verticils subequal in length to the segments. Head in front grey, darker behind; anterior vertex not wider than three rows of ommatidia.

Pronotum reduced, more or less hidden between the head and the slightly projecting praescutum; anterior pretergites obscure yellow. Mesonotal praescutum polished black, without markings; praescutal setae very sparse but long; posterior sclerites of notum brownish-black; pleurotergite a little brightened. Pleura brownish-black. Halteres elongate, stem obscure yellow, especially at base, knob brownish-black. Legs with the coxae obscure yellow, the base of fore coxae very narrowly more infuscated; trochanters obscure yellow; remainder of legs brownish-black; claws elongated, untoothed. Wings with a strong uniform blackish tinge; stigma long-oval, scarcely differentiated from the ground; prearcular field a trifle brightened; veins brown. Macrotrichia of *Rs* and veins beyond cord long and very abundant; costal fringe relatively long and dense. Venation: As described under the subgenus.

Abdomen black, the basal sternites more obscure brownish-yellow. Male hypopygium as discussed under the subgenus; basistyle moderately long and stout; dististyle terminal. Ninth tergite narrow, the posterior margin with two submedian obtusely rounded lobes that are separated by a deep linear notch. Gonapophyses appearing as straight slender rods, their tips obtusely rounded. Phallosomic mass with distal portion bent laterad, the apex obtusely rounded.

Holotype, ♂, Ompo, altitude 300 feet, 30 May, 1938 (Yankovsky).

The peculiarities of the present fly have been discussed sufficiently under the subgeneric and specific diagnoses. There is no crane-fly with which this insect can possibly be confused.

Pedicia (Tricyphona) acicularis sp. n.

Size medium (wing, male, over 9 mm.); general coloration grey, the praescutum with three inconspicuous, darker grey stripes; antennae 16-segmented, short; scutellum obscure reddish-yellow; halteres relatively long, obscure yellow; femora yellow, the tips narrowly infuscated; wings brownish-yellow, variegated by the slightly darker stigma and a cloud over the anterior cord; R_{4+5} present; *Rs* relatively long, square and spurred at origin; cell 1*st* M_2 closed; abdominal tergites dark brown, the lateral borders broadly yellow; sternites yellow; terminal segments more uniformly blackened; male hypopygium with the caudal margin of ninth tergite straight, the lateral angles produced caudad into conspicuous straight spines; apex of basistyle densely set with spinous points; dististyle a flattened triangular head.

Male.—Length, about 10 mm.; wing, 9·7 mm.; antenna, about 0·8 mm.

Rostrum and palpi dark brown. Antennae 16-segmented, short; scape dark brown; pedicel and first flagellar segment obscure yellow, outer flagellar segments passing into black; flagellar segments short-oval. Head grey; anterior vertex broad, at least four times the diameter of scape.

Pronotal scutum dark brown, sparsely pruinose; scutellum and pretergites obscure yellow. Mesonotal praescutum grey, with three darker grey stripes that are very in-

conspicuous against the ground, the median stripe more or less split behind; scutum grey, the lobes chiefly dark grey; scutellum obscure reddish-yellow; postnotum dark grey, the suture between mediotergite and pleurotergite yellow; anapleurotergite paler. Pleura light grey, darker in ventral anepisternum and sternopleurite; pteropleurite chiefly yellow, sparsely pruinose; dorsopleural membrane yellow. Halteres relatively elongate, obscure yellow. Legs with the coxae yellow, rather heavily pruinose; trochanters yellow; femora yellow, the tips passing into brown; tibiae light brown, beyond base passing into darker brown; tarsi black. Wings brownish-yellow, variegated by the slightly darker brown oval stigma and a small but distinct brown cloud over the anterior cord; veins brown, yellow in the more brightened prearcular field. Venation: *Sc* long, Sc_1 ending shortly before level of *m*, Sc_2 a short distance before origin of *Rs*, this distance less than one-half *Rs*, the latter elongate, square and short-spurred at origin; R_{1+2} and R_2 subequal; R_{4+5} distinct, subequal to R_2; *r-m* just beyond fork of R_{4+5} on R_5; cell M_1 subequal to its petiole; cell 1*st* M_2 closed; *m-cu* about its own length beyond the fork of *M*; M_{3+4} nearly as long as vein M_4 alone.

Abdominal tergites dark brown, the lateral borders broadly yellow; sternites uniformly yellow; outer segments, including hypopygium, more uniformly blackened. Male hypopygium with the tergite transverse, its caudal margin straight, the lateral angles produced into very conspicuous, straight, needle-like spines from somewhat more enlarged bases; these spines are directed caudad, gradually narrowed into acute points. Basistyle relatively stout, on face with a low lobe and a concentration of setae; the apex of style a simple stout lobe provided with abundant short black spinous pegs, continued basad to the constriction delimiting the position of the dististyle; interbase a simple flattened blade lying against the face of basistyle, its apex broadly obtuse. Dististyle simple, appearing as a flattened triangular head, widest at midlength, thence gradually narrowed to the obtuse tip. Phallosome consisting of two dusky blades, their tips directed laterad, each with a subtending, very extensive, pale yellow flattened plate that is microscopically setuliferous.

Holotype, ♂, Puksu Pyaksan, Kankyo Nando, altitude 3700 feet, 3 June, 1939 (Yankovsky).

Pedicia (*Tricyphona*) *acicularis* is quite distinct from the very few other regional species that have a somewhat similar venation, that is, with vein R_{4+5} present and with *r-m* connecting with R_5, as in *P.* (*T.*) *diaphana* (Doane), *P.* (*T.*) *trifurcata* (Edwards), and similar forms. In the local fauna, such species include *P.* (*T.*) *diaphanoides* Alexander and *P.* (*T.*) *emarginata* sp. n. As usual in the TIPULIDAE, the male hypopygium provides the most distinctive characters for the separation of all these species.

Pedicia (Tricyphona) emarginata sp. n.

Size relatively small (wing, male, 7 mm.); general coloration grey, the praescutum with three blackened stripes; halteres infuscated, the base of stem narrowly yellow; legs brown, the femoral bases narrowly more brightened; wings with a strong blackish tinge, the stigma still darker; R_{4+5} distinct, nearly twice *r-m*; cell 1*st* M_2 closed; *m-cu* near midlength of vein M_{3+4}; male hypopygium with the tergite large, its caudal border deeply emarginate to produce large flattened lateral lobes; dististyle elongate-triangular, projecting beyond the level of the lobes of the basistyle.

Male.—Length, about 6·5 mm.; wing, 7 mm.; antenna, about 0·9 mm.

Rostrum and palpi black. Antennae short and degenerate, black throughout; in type, with only 11 flagellar segments, the first enlarged and apparently a fusion; second flagellar segment conical, shorter than the third; terminal segment subequal in length to the penultimate. Head grey; eyes relatively small; anterior vertex wide, approximately three times the diameter of scape.

Pronotal scutum brown; scutellum yellow. Mesonotal praescutum brownish-grey, with three blackened stripes, the median one somewhat more polished and distinct; lateral stripes crossing the suture on to the scutal lobes; scutellum and median region of scutum obscure yellow; postnotum brown. Pleura obscure yellow, variegated with brown on the anepisternum and ventral sternopleurite; pteropleurite clear yellow; meral region a trifle darkened. Halteres relatively long, infuscated; base of stem narrowly yellow. Legs with the coxae obscure brownish-yellow; trochanters yellow; remainder of legs brown, the femoral bases narrowly more brightened, the terminal tarsal segments darker. Wings with a strong blackish tinge, the stigma still darker; a small and very vague darkened cloud over the anterior cord; veins dark brown. Venation: Sc_1 ending beyond the level of cord, Sc_2 far before the origin of *Rs*, the distance about one-fourth longer than *Rs* alone; R_{1+2} and R_2 subequal; R_{4+5} distinct, nearly twice *r-m*, the latter longer than the basal section of vein R_5; cell 1*st* M_2 closed by the retention of *m*, this subobsolete to scarcely evident; cell M_1 varying from about three-fifths to nearly one-half its petiole; *m-cu* close to midlength of M_{3+4}.

Abdomen brown, the tergites still darker laterally and caudally, sparsely pruinose; basal sternites more yellowish-brown, narrowly darker laterally; outer segments and hypopygium more blackened. Male hypopygium with the tergite large, widened outwardly, its caudal border with a broad and deep U-shaped emargination, the lobes large and conspicuous, with abundant setae and, near their tips, dense setulae; lateral margins with tergal arms. Apical lobes of basistyle unequal, the larger one with large blackened spinous points, the smaller lobe chiefly with elongate setae; no evident interbasal rod in the unique type. Dististyle elongate-triangular, projecting beyond the basistyle, narrowed to the obtusely rounded apex.

Holotype, ♂, Seren Mountains, altitude 4500 feet, 10 July, 1938 (Yankovsky).

Pedicia (*Tricyphona*) *emarginata* is quite distinct from all regional species of the subgenus, especially in the nature of the tergite of the male hypopygium. In this regard it suggests certain Asiatic species of *Dicranota* (*Rhaphidolabis*) but the reference to *Tricyphona* seems correct. It may be re-emphasised, however, that the characters used to differentiate *Dicranota* from *Pedicia* (*Tricyphona*) are becoming less tenable as new types continue to be discovered, particularly in Asia. I would consider the present fly to be closest to *P.* (*T.*) *diaphanoides* Alexander.

Pedicia (Tricyphona) depressiloba sp. n.

Allied to *vetusta*; general coloration of head and thorax grey, the praescutum with four brown stripes; femora yellow basally, the tips blackened, narrowest on the posterior legs; wings fulvous yellow with a restricted brown pattern; cell M_3 deep; male hypopygium with the dorsal surface of ninth tergite on either side of median line with a low depressed lobe that has more than a score of setae.

Male.—Length, about 11–12 mm.; wing, 11·5–13·5 mm.; antenna, about 1·3–1·5 mm.

Female.—Length, about 13–14 mm.; wing, 12–13 mm.

Rostrum grey pruinose; palpi black. Antennae 16-segmented, black, the scape more or less pruinose; flagellar segments oval, decreasing in size outwardly. Head light grey, the central portion of vertex more infuscated.

Pronotum grey, infuscated behind, the posterior border of scutum and the scutellum more reddened. Mesonotal praescutum grey with four brown stripes; posterior sclerites of notum clear light grey, the centres of the scutal lobes patterned with brownish-grey; parascutella more brownish-yellow. Pleura clear grey, the anepisternum and ventral sternopleurite patterned with darker grey; dorsopleural membrane more buffy. Halteres pale yellow, in cases with knobs weakly darkened. Legs with coxae pale, grey pruinose;

trochanters yellow; femora yellow basally, passing into black, these darkened tips very broad on fore legs, including about the outer two-thirds, narrower on middle femora, where about the outer half is included, very narrow on posterior legs, where about the distal eighth is darkened; tibiae yellowish-brown, blackened apically; tarsi black. Wings with the ground fulvous yellow, brighter yellow at base, stigmal region and in costal field; a conspicuous but restricted brown pattern, arranged as follows: Sc_2; origin of *Rs*; a complete band at cord; R_{1+2} and R_2; *m*; a series of marginal clouds over the longitudinal veins, largest at wing apex where they become more or less confluent, the spot at *2nd A* of moderate size only; in some cases, a cloud over fork of M_{1+2}; veins light brown, darker brown in the patterned portions, yellow in the brightened fields. Venation: Unusually variable; most of cord transverse, the outer section of Cu_1 lying more distad; *r-m* at or before fork of *Rs*; an element R_{2+3+4} present, suberect; *Rs* in direct longitudinal alignment with R_5; M_{3+4} very variable, usually present but short, in cases entirely lost; cell *1st* M_2 closed; *m* on M_2, in cases at about its own length beyond fork; *m-cu* at or beyond fork of M_{3+4}, where the latter is short or lacking up to its own length beyond the fork.

Abdomen with basal tergite chiefly brownish-grey, more yellowed basally; succeeding tergites yellow, narrowly trivittate with dusky, the median stripe broken, or, if more nearly entire, becoming narrow and subobsolete on outer segments; sternites yellow; subterminal segments blackened, grey pruinose, the basistyles reddish-yellow to brown. Male hypopygium as in the group, differing from all regional species especially in the structure and vestiture of the ninth tergite and basistyle. Ninth tergite with the caudal margin gently emarginate, leaving a very low and inconspicuous lobe on either side of a wide central space; on dorsal surface of tergite with a low depressed lobe that bears more than a score of strong setae. Basistyle with setae of outer face relatively small and inconspicuous, more numerous on mesal aspect; interbase strong and powerful, pointed at apex.

Holotype, ♂, Ompo, altitude 100 feet, 15 June, 1937 (Yankovsky). Allotopotype, ♀, pinned with a paratype, 10 June, 1937. Paratopotypes, several ♂♀, altitude 100–120 feet, 10–15 June, 1937; paratypes, 1 ♂, Puksu Pyaksan, Kankyo Nando, altitude 6000 feet, 15 June, 1939 (Yankovsky).

In the Japanese islands there are three allied species, *Pedicia* (*Tricyphona*) *seticauda* Alexander, *P.* (*T.*) *setipennis* Alexander, and *P.* (*T.*) *vetusta* Alexander, that much resemble the present fly but differ conspicuously in details of structure of the male hypopygium, particularly of the tergite, with its low, depressed, dorsal lobes in this species. The common low-altitude species in central Japan is *vetusta* which has the tergal lobes elongate and very conspicuous but with the vestiture of the tergite and basistyle only moderately developed. The two other species listed are high mountain forms, chiefly known from the Japanese Alps; *seticauda* likewise has the dorsal tergal lobes very conspicuous but unusually stout, both the tergite and basistyle with the setae unusually long and abundant; in *setipennis*, not only are there conspicuous differences in the tergite but the wings have strong macrotrichia in the outer cells.

For this particular group of flies, including likewise various species in the western Palaearctic region (as *occulta* Meigen and allies) and in the eastern Nearctic (as *vernalis* Osten Sacken and allies), Edwards has re-instated the subgeneric name *Amalopis* Haliday (*Olecranopelma* Enderlein) but in the light of occurrence of several other peculiar types of *Tricyphona* found elsewhere in the world, particularly in western North America, Japan, the Indo-Himalayan region, and Chile, I hesitate to recognise these minor subgeneric divisions until the entire genus *Pedicia* can be reviewed in the light of the numerous discoveries constantly being made. For this reason I am placing all of these species in the oldest subgenus, *Tricyphona* Zetterstedt.

Dicranota (Rhaphidolabis) ompoana sp. n.

General coloration grey, the praescutum with three entire, darker brown stripes; antennae short, 13-segmented, black throughout; halteres with knobs weakly infuscated; legs brown; wings whitish subhyaline, the base even more whitened, stigma pale brown; cell R_3 sessile; vein R_4 in exact longitudinal alignment with *Rs*; male hypopygium with the median region of tergite produced into a transverse quadrate lobe; lateral tergal arms appearing as slender, strongly curved spines; interbase a flattened yellow blade, its apex microscopically serrulate.

Male.—Length, about 6 mm.; wing, 7 mm.; antenna, about 0·5 mm.

Rostrum grey; maxillary palpi black; what appear to represent labial palpi obscure yellow, large and conspicuous. Antennae 13-segmented, short, black throughout; flagellar segments long-oval, the first about one-half longer than the second. Head grey.

Pronotum grey. Mesonotal praescutum obscure brownish-grey, with three entire darker brown stripes, the median one undivided; posterior sclerites of notum light grey, the scutal lobes slightly patterned with darker. Pleura grey, the ventral sternopleurite and meral region slightly darker; dorsopleural membrane obscure yellow. Halteres with stem yellow, knob weakly infuscated. Legs with fore and middle coxae pale, heavily grey pruinose; posterior coxae more yellow; trochanters yellow; remainder of legs pale brown, the tips of femora or tibiae scarcely darker. Wings whitish subhyaline, the stigmal region a trifle darker; wing base more milky white; veins pale brown. Venation: *Rs* moderately long, strongly arcuated; cell R_3 sessile, vein R_4 being in direct longitudinal alignment with R_4 so no elements R_{2+3+4} or R_{4+5} are present; vein R_2 oblique, about twice R_{1+2}.

Abdomen, including hypopygium, dark brown, grey pruinose.

Holotype, ♂, Ompo, altitude 700 feet, 8 May, 1938 (Yankovsky).

The most similar and more nearly allied species are the Japanese *Dicranota* (*Rhaphidolabis*) *plana* Alexander and *D.* (*R.*) *spina* Alexander, both of which, while being similar in general appearance, including the wing pattern and venation, differ in all details of structure of the male hypopygium.